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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/621,483	07/16/2003	Wipul Jayasekara	SJO920000096US3	2581

7590 08/26/2004

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EXAMINER	
RENNER, CRAIG A	

ART UNIT	PAPER NUMBER
2652	

DATE MAILED: 08/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/621,483	JAYASEKARA, WIPUL	
	Examiner	Art Unit	
	Craig A. Renner	2652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 July 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,9,11,19,21 and 23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,11,21 and 23* is/are rejected.

7)☒ Claim(s) *9 and 19* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 July 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to because of the following informalities:

a. The drawings fail to comply with 37 CFR 1.84(p)(5) because they include one or more reference signs not mentioned in the description. Note, for instance, "AF" (shown in FIG. 1A, for instance), "PL" (shown in FIGS. 1A, 2A, 2B, 3A, 3B, 4A, 4B, and 7, for instance), "FL" (shown in FIGS. 1A, 2A, 2B, 3A, 3B, 4A, 4B, and 7, for instance), "H.B." (shown in FIG. 1B, for instance) and "TB" (shown in FIG. 8, for instance).

b. The drawings fail to comply with 37 CFR 1.84(p)(5) because they do not include one or more reference signs mentioned in the description. Note, for instance, "28" (disclosed as a "second lead (L2) layer" in line 9 on page 5, for instance).

Corrected drawing sheets in compliance with 37 CFR 1.121(d) and/or amendment to the specification in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

3. The disclosure is objected to because of the following informalities:

a. In lines 16 and 17 on page 13, each instance of "second AFM layer 172" should be changed to --second AFM layer 173—in order to be consistent with the remainder of the disclosure.

b. In line 29 of claim 11, "the magnet recording disk surface" should be changed to --the magnetic recording disk surface-- in order to more clearly refer back to that set forth in line 2 of claim 11.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1 and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Komuro et al. (US 6,327,107).

Komuro teaches a direct access storage device (FIG. 10, for instance) comprising a magnetic recording disk (110) having at least one surface for storing magnetically recorded data; a magnetic read head (210) having an air bearing surface disposed for reading the data from the magnetic recording disk surface; in the magnetic read head, a magnetic tunnel junction sensor (FIG. 5, for instance) comprising a magnetic tunnel junction stack (20) with an active region disposed at the air bearing surface and having two opposite sides each disposed generally orthogonally to the air bearing surface (as shown in FIG. 5, for instance), the magnetic tunnel junction stack comprising an antiferromagnetic layer (4) spanning the active region, a pinned layer (2) of ferromagnetic material (line 3 in column 4, for instance) in contact with the antiferromagnetic layer (as shown in FIG. 5, for instance), a free layer (3) of ferromagnetic material (line 2 in column 4, for instance) spanning the active region and extending beyond each of the two opposite sides thereof (as shown in FIG. 5, for instance), and a tunnel junction layer (1) of electrically nonconductive material (lines 2-3 in column 4, for instance) disposed between the pinned layer and the free layer in the active region (as shown in FIG. 5, for instance); and a longitudinal bias layer (7) formed on and in contact with the free layer outside of the active region (as shown in FIG. 5, for instance) for biasing the magnetic moment of the free layer in substantially a predetermined direction in the absence of an external magnetic field; an actuator (320) for moving the magnetic read head across the magnetic recording disk surface to

access the data stored thereon; and a data channel (includes 332, for instance) having sense circuitry coupled electrically to the magnetic tunnel junction sensor for detecting changes in resistance of the magnetic tunnel junction sensor caused by rotation of the magnetic moment of the free ferromagnetic layer relative to the fixed magnetic moment of the pinned layer responsive to magnetic fields representing the data stored on the magnetic recording disk surface [as per claims 1 and 11].

6. Claims 21 and 23 are rejected under 35 U.S.C. 102(e) as being anticipated by Aoshima et al. (US 6,249,407).

Aoshima teaches in a magnetic read head (FIG. 3, for instance) having an air bearing surface, a magnetic tunnel junction sensor comprising a magnetic tunnel junction stack (10) with an active region disposed at the air bearing surface and having two opposite sides each disposed generally orthogonally to the air bearing surface (as shown in FIG. 3, for instance), the magnetic tunnel junction stack comprising an antiferromagnetic layer (lines 58-61 in column 4, for instance, i.e., "PdPtMn (20)") spanning the active region, a pinned layer of ferromagnetic material (lines 58-61 in column 4, for instance, i.e., "Co (2)") in contact with the antiferromagnetic layer, a free layer of ferromagnetic material (lines 58-61 in column 4, for instance, i.e., "NiFe (2)/Co (1)") spanning the active region, and a tunnel junction layer of electrically nonconductive material (lines 58-61 in column 4, for instance, i.e., "Al_2O_3 (5)") disposed between the pinned layer and the free layer in the active region; and a nonconductive (lines 40-41 in column 5, for instance) longitudinal bias layer (16A-16B) formed outside of the active

region (as shown in FIG. 3, for instance) and in abutting contact with the two opposite sides of the active region (as shown in FIG. 3, for instance) [as per claim 21]; wherein the head is a component of a direct access storage device (line 64 in column 5 through line 3 in column 6, for instance) comprising a magnetic recording disk having at least one surface for storing magnetically recorded data (line 65 in column 5, for instance); an actuator for moving the magnetic read head across the magnetic recording disk surface to access the data stored thereon (lines 64-65 in column 5, for instance); and a data channel having sense circuitry coupled electrically to the magnetic tunnel junction sensor (line 65 in column 5 through line 3 in column 6, for instance, for instance) [as per claim 23].

7. Claims 21 and 23 are rejected under 35 U.S.C. 102(e) as being anticipated by Fullerton et al. (US 6,650,513).

Fullerton teaches in a magnetic read head (FIG. 12, for instance) having an air bearing surface, a magnetic tunnel junction sensor comprising a magnetic tunnel junction stack (includes 116', 118', 120' and 132') with an active region disposed at the air bearing surface and having two opposite sides each disposed generally orthogonally to the air bearing surface (as shown in FIG. 12, for instance), the magnetic tunnel junction stack comprising an antiferromagnetic layer (116') spanning the active region, a pinned layer of ferromagnetic material (118') in contact with the antiferromagnetic layer, a free layer of ferromagnetic material (132') spanning the active region, and a tunnel junction layer of electrically nonconductive material (120') disposed between the pinned

layer and the free layer in the active region; and a nonconductive (lines 2-3 in column 10, for instance) longitudinal bias layer (150') formed outside of the active region (as shown in FIG. 12, for instance) and in abutting contact with the two opposite sides of the active region (as shown in FIG. 12, for instance) [as per claim 21]; wherein the head is a component of a direct access storage device (lines 4-8 in the abstract, for instance) comprising a magnetic recording disk having at least one surface for storing magnetically recorded data (line 5 in the abstract, for instance); an actuator for moving the magnetic read head across the magnetic recording disk surface to access the data stored thereon (lines 4-8 in the abstract, for instance, i.e., an actuator for moving a head across a disk surface to access data stored thereon is an inherent component of a "disk drive"); and a data channel having sense circuitry coupled electrically to the magnetic tunnel junction sensor (lines 4-8 in the abstract, for instance, i.e., a data channel having sense circuitry coupled electrically to a sensor is an inherent component of a "disk drive") [as per claim 23].

Pertinent Prior Art

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. This includes Wang et al. (US 6,330,136), Redon et al. (US 6,381,107), Redon et al. (US 6,469,879), Hayashi et al. (US 6,542,342) and Shimazawa et al. (US 6,671,141), which each individually teaches a magnetic tunnel junction sensor with a free layer thereof spanning an active region and extending beyond opposite sides thereof and a longitudinal bias layer formed on and in contact with the free layer outside

of the active region; and Gill (US 6,661,626), Miyauchi et al. (US 2001/0021089) and Carey et al. (US 2002/0154456), which each individually teaches a magnetic tunnel junction sensor with a nonconductive longitudinal bias layer formed in abutting contact with opposite sides of an active region of a magnetic tunnel junction stack.

Allowable Subject Matter

9. Claims 9 and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig A. Renner whose telephone number is (703) 308-0559. The examiner can normally be reached on Tuesday-Friday 7:30 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa T. Nguyen can be reached on (703) 305-9687. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Craig A. Renner
Primary Examiner
Art Unit 2652

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